PATENT SPECIFICATION

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(54) SHOCK-ABSORBING SUPPORT COMPRISING A RESILIENT BLOCK WITH CAVITIES THEREIN

(71) We, PAULSTRA, a Body Corporate organised and existing under the Laws of France, of 61 Avenue Marius-Aufan, 92305—Levallois-Perret, France, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

The present invention relates to a resilient support for interposition between two structures, one of which must be protected against shocks and vibrations which are liable to occur in several directions, for example between the body or engine of a vehicle and its chassis or between a freight container and the vehicle, aeroplane or ship on which it is carried.

For such purposes it is known to use blocks of elastomer having cavities therein.

In accordance with the present invention there is provided a resilient support for interposition between two structures comprising at least one block of elastomer bonded on the one hand to a fixing element for attachment to one of the structures and on the other hand to three orthogonal metal plates for attachment to the other structure, the block having respective cavities disposed between the fixing element and each of the orthogonal plates.

The cavities allow the block of elastomer, when subjected to shocks and vibrations, to work at first by flexing and shearing and thereafter, if the cavities are closed, in compression.

Each of the cavities is preferably defined between surfaces parallel to the respective plate and may open onto a free face of the block.

In a preferred form the block is a rectangular body with the faces which are bonded to the said plates enlarged by means of projections from the rectangular body, the cavities being at least partially with the said projections. This construction enables the dimensions of the cavities to be increased.

The invention will now be described in more detail with the aid of examples illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of a resilient support in accordance with the invention,

Figure 2 is a similar view of a second form of resilient support in accordance with the invention, and

Figures 3 and 4 are sections in two orthogonal planes and Figure 5 is a side elevation of a third form of resilient support in accordance with the invention.

The resilient support shown in Figure 1, which is intended to absorb shocks or vibrations in three orthogonal directions, comprises a rigid metallic member 1 in the form of a triple dihedron consisting of three plates, orthogonal to one another, which in this instance are integral with one another but, as shown in Figures 2 to 5, may be separate. A resilient block 2 in the form of a cube has three of its sides bonded respectively to the three plates of the metallic member 1, the bonding being effected by any of the conventional techniques.

For each of three perpendicular directions in which shocks may occur at least one cavity 3 is formed in the block 2. Each cavity 3 lies adjacent and generally parallel to one of the plates of the member 1 to take up shocks in a direction perpendicular to that plate. Each cavity opens at one end on a free face of the block 2.

Embedded in the block 2 there is a metallic fixing element 4 with a threaded bore 5. The unit or assembly to be supported, such as a motor or container, can be attached to the fixing element 4 by means of a screw engaged in the threaded bore 5. The member 1 is itself provided with means for fixing it to a chassis or other assembly intended to support the load, such means comprising holes 6 for the passage of pins or the like and/or of projecting screws or pins 7 as shown in Figures 3 to 5.

lient supports to the assembly A and base B.

When shocks and vibrations are applied in a vertical direction, as shown by the arrow F in Fig. 1, these are absorbed by the resilient supports. Initially the faces of the elastomer adjacent to the cavities 3 work in flexion and by shearing. If the forces are large enough to close the cavities, the elastomer will then work in compression. It is evident that the supports are also deformable in directions perpendicular to the vertical direction but the elastomer then works differently.

Figs. 3 and 4 concern resilient supports constructed to withstand forces applied in two perpendicular directions. In this case each of the metal plates 1 is integral with a second orthogonal plate to form a dihedron, the block 2 has two pairs of parallel faces which are perpendicular to one another and bonded to corresponding parts of the plates 1 and the block 2 has a second cavity 3 whose axis is parallel to that of the first cavity and whose cross-section is elongated in a direction parallel to that of the first cavity. Such bi-directional supports will behave similarly whether the applied forces are in the vertical direction X (Fig. 4) or in the perpendicular direction Y. In each case the initial flexion and shear is followed by compression when the cavity is closed up.

Reference is made to our Application No. 18935/77 (Serial No. 1578863), from which the present application has been divided. In that application the invention claimed is a resilient support for interposition between two structures comprising at least one block of elastomer bonded on the one hand to a fixing element for attachment to one of the structures and on the other hand to three orthogonal metal plates for attachment to the other structure, the block having respective cavities disposed between the fixing element and each of the orthogonal plates.

WHAT WE CLAIM IS:–

1. A resilient support for interposition between two structures comprising at least one block of elastomer having pairs of parallel faces, the faces of one pair being offset with respect to each other and bonded to respective plates which are to be attached to the two structures, the block also having a cavity whose axis extends parallel to the said one pair of faces and whose cross-section is elongated in a direction joining the said one pair of faces which is oblique to each face of the said one pair of faces.

2. A resilient support as claimed in claim 1 in which the block of elastomer has a cross-section transverse to the axis of the cavity in the form of a parallelogram.

3. A resilient support as claimed in claim 1 in which the block has a second pair of faces orthogonal to the first pair, each of the plates bonded to the faces of the first pair is integral with an orthogonal plate bonded to a respective face of the second pair, and the block has a second cavity whose axis is parallel to that of the first cavity and whose cross-section is elongated in a direction parallel to that of the first cavity.

4. A resilient mounting for interposition between an apparatus and a base, the mounting comprising two resilient supports in accordance with any one of claims 1 to 3 whose cavities are disposed symmetrically on opposite sides of an axis of the assembly.

5. A resilient support substantially as described with reference to Figs. 1 and 2 or Figs. 3 and 4 of the accompanying drawing.

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1578863 COMPLETE SPECIFICATION

2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheet 1

Fig. 1.

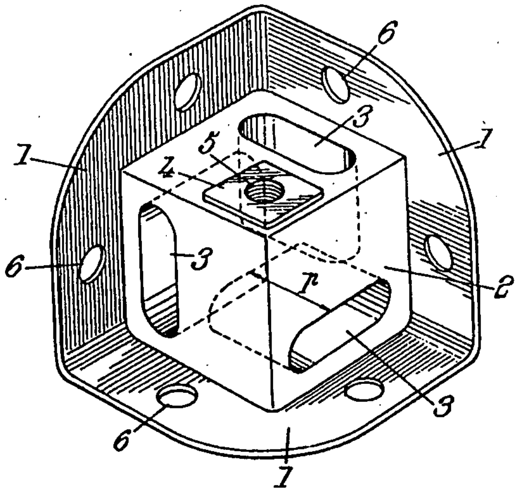


Fig. 2.

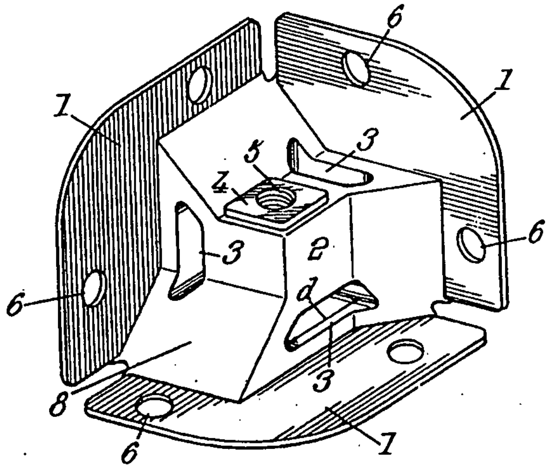


Fig. 3.

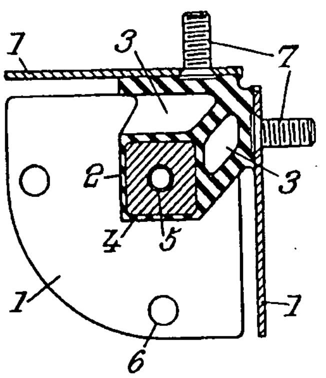
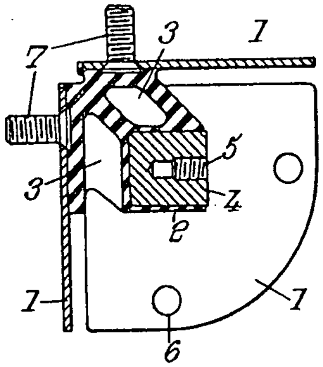


Fig. 4.



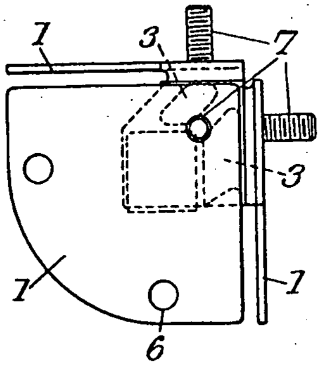


Fig. 5.